

REMARKS

The Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and the reasons that follow.

I. Status of the Claims and Claim Objections

Claims 1 and 10 are amended to make minor editorial changes. No new matter is introduced. Non-elected claims 11-16 are withdrawn. Claims 1-10 are currently under examination on their merits.

As a result of the foregoing amendments, the objections to claims 1 and 10 should now be moot.

II. Claim Rejections – 35 U.S.C. § 103

Claims 1-9 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Pub. No. 2002/0182478 (“Uchida”). Claim 10 is rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Uchida and further in view of U.S. Pub. No. 2003/0104284 (“Inagaki”). The Applicant respectfully traverses.

(A) Current Obviousness Standard

The U.S. Supreme Court reaffirmed the Graham factors for determining obviousness in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007). The Graham factors, as outlined by the Supreme Court in *Graham et al. v. John Deere Co. of Kansas City et al.*, 383 U.S. 1 (1966), are: 1) determining the scope and contents of the prior art; 2) ascertaining the differences between the claimed invention and the prior art; 3) resolving the level of ordinary skill in the pertinent art; and 4) evaluating evidence of secondary consideration. The Supreme Court recognized that a showing of “teaching, suggestion, or motivation” to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a) and held that the proper inquiry for determining obviousness is whether the improvement is more than the predictable use of prior art elements according to their established functions. The Court noted that it is

"important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed and specifically stated:

Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was *an apparent reason to combine the known elements in the fashion claimed* by the patent at issue. To facilitate review, this analysis should be made explicit.

KSR Int'l Co. v. Teleflex Inc., slip op. at 14 (emphasis added). As discussed below, the cited art cannot render the claimed invention obvious.

(B) *The present claims are nonobvious over the teachings of Uchida and/or Inagaki*

The teachings of Uchida are distinguishable from the presently claimed polymer electrolyte composite membranes. Uchida's teachings are directed to a catalyst layer, comprising carbon particles and a noble metal catalyst. Uchida, Abstract. Specifically, Uchida discloses a fuel cell comprising a polymer electrolyte membrane and a pair of electrodes having a catalyst layer on a surface, which is in contact with the polymer electrolyte membrane and sandwiching the polymer electrolyte membrane there between, wherein the catalyst layer of at least one of the electrodes comprises carbon particles supporting a noble metal catalyst, and the carbon particles include at least two kinds of carbon particles adsorbing a polymer electrolyte in mutually different dispersed states. Uchida further describes in ¶[0049] the necessity of having sufficient gas pass through the catalyst layer 2. *See also*, Fig. 1 of Uchida, which shows fuel electrode 9 and oxygen electrode 10, both of which include catalyst layer 2 that has many openings or chinks.

By contrast, the presently claimed embodiments are related to a polymer electrolyte membrane. In other words, the component in Uchida that can be properly compared to the presently claimed embodiments is the polymer electrolyte membrane 11 in Fig. 1 of Uchida, and not a composite comprising such a member and two catalyst layers, as asserted by the Office on page 4 of the Office Action. In fact, contrary to the Office's assertion on page 3 of

the Office Action, Uchida in ¶[0061] does not disclose a “polymer electrolyte composite membrane” – rather, in ¶[0061], Uchida describes an embodiment in which a polymer electrolyte membrane and polymer electrolyte in the electrode coexist to form a “joined interface.” A joined interface of two components is not the same as a composite membrane.

Furthermore, even assuming, *arguendo*, that the system of Uchida could be compared to the presently claimed embodiments, the comparison would further point to the distinctions between the two. One of ordinary skill in the art can appreciate that it is **undesirable** to have gases pass through a polymer electrolyte membrane (e.g., element 11 in Fig. 1 of Uchida) because fuel efficiency will decrease if fuel gas (such as H₂) passes from the fuel electrode through the membrane to the oxygen electrode. This is evidenced in that the fine pores of a porous base material in the presently claimed embodiments are filled with a polymer electrolyte. Therefore, if one were to consider the combination of the porous catalyst layer 2 and the membrane 11 of Uchida as one “composite membrane,” as alleged by the Office on page 3 of the Office Action, such a composite membrane would be porous, thus rendering the modification unsatisfactory for its intended purpose as a fuel cell. MPEP § 2143.01 (V) (stating that if proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification). Thus, no *prima facie* obviousness is established.

The Office relied on Inagaki’s teachings merely because Inagaki teaches hydrophilic polar groups, but the teachings of Inagaki do not remedy the foregoing deficiencies of Uchida. Thus, one of ordinary skill in the art would not have had a reason to combine the teachings of Uchida with those of Inagaki. Even assuming, *arguendo*, that these teachings were combined, the presently claimed invention would not have resulted.

Therefore, at least in view of the foregoing, the Applicant respectfully requests that the rejections be withdrawn.

CONCLUSION

The Applicant believes that the present application is now in condition for allowance and respectfully requests favorable reconsideration of the application.

The Office is invited to contact the undersigned by telephone if a telephone interview would advance the prosecution of the present application.

The Office is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, the Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorizes payment be charged to Deposit Account No. 19-0741.

Respectfully submitted,

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